Residential Measures

February 4, 2003 Workshop

Construction Quality - Walls

- Proponent: CEC
- Workshop: April 23
- Standard: Res Envelope

- A compliance credit is offered for special inspection by a HERS rater.
- An overall U-factor multiplier is applied within the ACM. Form 3 unchanged.
- The inspection protocol is documented in ACM RQ.

Changes since the November 2002 draft:

- Revised and improved the inspection criteria and eliminated density testing.

Construction Quality - Ceilings

- Proponent: CEC
- Workshop: July 18
- Standard: Res HVAC

- A compliance credit is provided for field verified high quality installation of insulation in ceilings, attic kneewalls and skylight shafts, and sealed draft stops.
- An overall U-factor multiplier is applied within the ACM. Form 3 calculations remain unchanged.
- The inspection protocol is documented in ACM RQ.

Changes since the November 2002 draft:

- Revised the criteria and eliminated density testing for cellulose.
- Required installed and settled thickness verification.

Residential Fenestration

- Proponent: CEC
- Workshop: May 30
- Standard: Res Envelope

- Residential area for the standard design is set equal to the proposed design unless it exceeds 20% of the conditioned floor area.
- Maximum west facing glass is 5%.

No changes since the November 2002 draft.

- Glazing U-factor criteria adjusted to be consistent with changes to NFRC rating procedures.

Window Replacements

- Proponent: Pacific Gas & Electric
- Workshop: April 23
- Standard: Res Envelope

- The prescriptive fenestration performance requirements apply for window replacements in existing buildings.
- These are implemented in §152(a) and §152(b).

Changes since the November 2002 draft:

- Field verification rules for alterations added to Chapter 7 of the ACM.
- Third party quality control programs added to Chapter 7 of the ACM.

Additions

Changes since November 2002 draft:

- Fenestration exception for less than 500 ft² is removed.

Alterations (Improvements to Existing Buildings)

Changes since November 2002 draft:

- Clarified existing plus alteration compliance.
- 152(b)1.D. requires new space conditioning ducts to have R-8 duct insulation and be sealed in Climates 2, 9-16 and insulated per Package D.
- 152(b)1.E. requires ducts to be sealed in Climates 2, 9-16 when a space conditioning system is installed or replaced.
  - Includes replacement of the air handler, cooling coil, heating coil, or furnace heat exchanger
  - Exception for replacement of outdoor unit
  - Exception for when ducts were previously diagnostically tested.
- Allowed to add up to 50 ft² of windows.

CF-1R (Computer Method)

- The C-2R form has been combined with the CF-1R to eliminate redundancy.

Package Alternatives to Not Require HERS Verification

- Update to footnotes to prescriptive packages that do not require HERS verification.

Maximum Allowable Cooling Capacity

- Proponent: CEC
- Workshop: July 18
- Standard: Res HVAC

- ACMs are required to calculate maximum allowable cooling equipment size (compressors).
- The maximum compressor size can be for the worst orientation for production homes and allows for available system sizes.
- The sizing procedure is documented in ACM RM-2005 and in the §151(h) of the Standards.
- Flexibility is offered when equipment is used that is more efficient at peak conditions.

No changes since the November 2002 draft.

Residential Ducts

- Proponent: CEC
- Workshop: July 18
- Standard: Res HVAC

- Standards require R-8 ducts instead of R-4 in all but Climates 6, 7, and 8.
- The modeling procedure for fans is modified and a credit is added for high efficiency fan and duct systems.
- Porous lined flex duct is prohibited.
- The modeling procedure for fans is added to ACM RF-2005 and ACM §3.2.13.

Changes since the November 2002 draft:

- Proposal on ducts buried in ceiling insulation accepted in general and will be implemented in the ACM manual.

Residential Computer Modeling

- Proponent: CEC
- Workshop: April 2
- Standard: Res Modeling

- Implemented in various sections of the Residential ACM manual.
- Changes include thermostat setpoints, slab edge loss model, natural ventilation assumptions, and solar gain factor adjustment.

No changes since the November 2002 draft.

HVAC Duct and Attic Hourly Models

- Proponent: Pacific Gas & Electric
- Workshop: April 2
- Standard: Res Modeling

- ACM RF-2005 is updated to implement the hourly duct modeling procedure.
- A seasonal duct efficiency is still used for ducts in locations other than attics.

Changes since the November 2002 draft:

- Procedure clarified and moved from the ACM Appendix to Chapter 4.
- TDV equipment model corrected.

Night Ventilation

- Proponent: Pacific Gas & Electric
- Workshop: Not scheduled
- Standard: Res Modeling

- This proposed compliance option has been withdrawn.

No changes since the November 2002 draft.

Hourly Water Heating Calculations

- Proponent: Pacific Gas & Electric
- Workshop: May 30
- Standard: Res Water Heating

- The hourly water heating methodology is implemented in ACM RN.
- The procedure works for low-rise residential buildings and for high-rise residential buildings.

Changes since the November 2002 draft:

- Language added to Chapter 3 of Residential ACM to define standard design.
- Errors corrected in ACM RN.

Water Heating Distribution Loss Performance Improvement Options

- Proponent: CEC
- Workshop: April 23
- Standard: Res Water Heating

- The credits for distribution losses are revised and implemented in ACM RN.
- Basecase losses are a function of both floor area and number of stories.

No changes since the November 2002 draft.

Water Heating in Multi-family

- Proponent: Pacific Gas & Electric
- Workshop: May 30
- Standard: Res Water Heating

- If the proposed design has individual water heaters, then so does the standard design. Likewise, if the proposed design has a central water heater, so does the standard design.
- Improved procedures are added to model losses from recirculation systems.

Changes since the November 2002 draft:

- Language added to Chapter 3 of Residential ACM to define standard design.

Residential Measures
California Energy Efficiency Standards 2005

Residential Lighting Measures

February 4, 2003 Workshop

Definition of High Efficacy Luminaire

[150(k)1.]

Lamp Power Rating (W)	Minimum Lamp Efficacy (Lumens/W)
15 and less	40
15 - 40	50
Over 40	60

- Electronic ballasts required for lamps greater than 18 W.
- Electronic ballasts must comply with EMI and RFI standards.

No changes since the November 2002 draft.

Lighting in Kitchens [150(k)2.]

- Permanently installed luminaires must be high efficacy.
- Up to 50% of power is excepted if it is switched separately.

No changes since the November 2002 draft.

Lighting in Bathrooms, Garages, and Support Spaces [150(k)3.]

- Permanently installed fixtures in bathrooms, garages, and support spaces (including laundry rooms and utility rooms) shall be high efficacy luminaires.
- Luminaires controlled by manual-on motion sensors are excepted.

No changes since the November 2002 draft.

Lighting Other Than in Kitchens, Bathrooms, Garages, and Support Spaces [150(k)4.]

- Permanently installed fixtures must be high efficacy luminaires, or.
- In spaces other than kitchens, bathrooms, garages, and support spaces, non-high efficacy luminaires are allowed if they are controlled by a dimmer.

Changes since the November 2002 draft:

- Clarified that requirements apply to all types of hardwired luminaires.
- Added specification for performance of dimmer switches.
- Non high efficacy luminaires allowed in closets less than 70 square feet.

Recessed Luminaires in Insulated Ceilings

[150(k)5.]

- Luminaires must be of type IC so that insulation can be installed in direct contact.
- Luminaires must be air tight as determined by ASTM E283.
  - Less than 2.0 cfm at 75 pascals of pressure.

No changes since the November 2002 draft.

Outdoor Lighting [150(k)6.]

- Luminaires must be high efficacy, unless:
  - Controlled by a motion sensor.
  - Used in or around a swimming pool or water feature.

Changes since the November 2002 draft:

- Exception that implied that low voltage lighting was intended to be covered by the requirements was removed.

Parking Lots and Garages [150(k)7.]

- Lighting for parking garages for more than 8 vehicles shall comply with the nonresidential requirements.

Changes since the November 2002 draft:

- Added Parking Lots for more than 8 vehicles.

Common Areas [150(k)8.]

- High efficacy luminaires required for common areas (hallways, lobbies, etc.).
  - Exception for luminaires controlled by a motion sensor.